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ABSTRACT

The study developed a definition of "independent living" for handicapped individuals and evaluated the definition's seven domains using data provided by 3,758 handicapped members of the 1980 sophomore cohort of the High School and Beyond National Longitudinal Survey (N=14,553). The seven domains are: (1) self-care and advocacy skills; (2) accommodation and living arrangements; (3) employment, education, and training; (4) transportation and mobility; (5) generic community services; (6) recreation and leisure activities; and (7) community interaction. Items from the three survey questionnaires were evaluated by experts in independent living who assigned them to one or more of the identified domains. Derived scales were then applied to assess group differences with comparisons made between those with and without handicaps, among the five specific handicapping conditions, and between rural and non-rural handicapped youth. Results found significant differences between rural and urban handicapped youth in the specific independent living domains with implications for educational programming. (Six tables/figures are provided.) (DB)

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Analysis of Seven Behavioral Domains of Independent Living

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Analysis of Seven Behavioral Domains of Independent Living

The impact of handicaps on the ability to live one's life autonomously varies greatly because of many environmental and demographic factors. Clowers and Belcher (1979) indicate that the physical or mental disability interacts with factors in the external environment to increase the severity of the handicap. Such factors can include lack of public transportation (Bikson & Bikson, 1981), the availability of suitable employment (Hasazi, Gordon, & Roe, 1985), or suitable housing (Lessard, 1982). Each of these can be seen as factors within rural settings which can act to restrict the independent living of those with handicaps.

The literature on independent living contains various types of definitions and conceptualizations. Unfortunately, many of these do not add much to understanding the skills and factors in the many domains of life necessary to live independently. Too often, the concerns of autonomy and life control for the person with a handicap are not addressed. Indeed, the goal of much of what is called independent living seems to refer more to developing skills within the individual to relieve the care-giving burden on others, rather than promoting a life free of constraints imposed by others. Much of the conceptualization of independent living comes from the research on persons with mental retardation, which focuses on aspects of life such as personal hygiene, self-care, or functional mathematics (e.g., Rusch, Chadsey-Rusch, White, & Gifford, 1985).

In a recent literature review on independent living, Harnisch, Fisher, Kacmarek, and DeStefano (1987) found that more than one-half of the articles were devoted to studies based on samples of persons with mental retardation. The definitions used in these research articles did not provide a clear picture that could aid an understanding of the mechanisms that underlie successful transition to independence within our society, nor the constraints which are faced by those with handicaps in trying to make this transition.

To formulate a better understanding of independent living, a definition has been derived to cover various aspects of one's life by identifying a number of critical domains to life where the person has to have skills, or will face various challenges from the external environment. These domains are: 1) self-care and advocacy skills, 2) accommodation and living arrangements, 3) employment, education, and training, 4) transportation and mobility, 5) generic community services, 6) recreation and leisure activities, and 7) community interaction (Harnisch, Chaplin, Fisher, & Tu, 1986).

In the development of this definition, Harnisch et al. (1986) were concerned with a broader conceptualization that could

be applied differentially depending upon the handicapping condition of the person, or because of the various external factors which impinge upon the life of the person. The use of such a definition can facilitate the growth programs and the modification of curricula to best serve the interests of the development of full autonomy and control for those with handicaps over their lives.

In this study, we have analyzed our definition's component parts, in order to derive scales to be used to differentiate between groups with specific handicaps, and between those with and without handicaps. This facilitates the identification of those areas of special needs that can be best addressed within the education framework. Thus, we wish to assist in overcoming the most pressing difficulties which restrict the growth of true independence of those who have disabilities.

Method

Subjects

The subjects for this study were the 14,553 students drawn from the 1980 sophomore cohort of American high school students who were surveyed by for the High School and Beyond (HSB) National Longitudinal Survey (Office of Educational Research and Improvement, 1986). Of these, 7185 were males and 7368 females, and 3758 identified themselves as having one of: learning disabilities, hearing orthopedic, speech, or other health impairments. These students were each surveyed in the base year, and the two subsequent biennial follow-ups.

Procedure

Items were selected from the three survey questionnaires and distributed to 12 experts in the areas of independent living, special education and rehabilitation. These judges indicated to which of the seven domains of independent living each item belonged. If it belonged to a domain not represented in the definition it was assigned to the "Other" category, and if it did not measure independent living at all it was placed in the "Not applicable" category). As many items had more than one component variable, judges could assign these items to more than one category.

To be assigned to an independent living domain, an item had to receive a majority of the judges' votes. Those which were assigned to the "Not applicable" category, or which failed to receive a majority assignment to a particular category were dropped from further analysis. Those items which had more than one component variable were individually evaluated and each variable was assigned to its appropriate independent living domain.

Analyses

The items retained were factor analyzed within their independent living domains in order to derive scales which could be used to assess group differences. Oblique rotations using the promax method were employed to derive the factor loading patterns. As there were so few items in the transportation and mobility and the generic services domains, they were excluded from the analyses.

The derived scales were used to assess several group differences. Comparisons were conducted between the following: those with handicaps and their nonhandicapped peers; the five specific handicapping conditions groups--learning disabilities (LD), hearing impairments (HI), speech impairments (SI), orthopedic impairments (OI), and other health impairments (OH); and rural and non-rural youth with handicaps.

Results

Demographics

Table 1 presents the distribution of youth with handicaps, and those without by ethnicity and type of community in which they live. In the cities, Hispanic (28%) and Black (20%) youth are more represented than in the rural areas with 22% of Hispanics and only 8% Blacks. In rural areas, there is a much higher percentage of white youth with handicaps (65%) than in the cities (49%). These figures indicate that the two locations have very different ethnic compositions of students with handicaps.

Another comparison of the differences between the handicapped populations of rural and non-rural schools is provided in Table 2. This table breaks down the handicapping conditions by ethnicity and type of community. In rural areas, Hispanics represent 40.7% of those with learning disabilities, and only 29.8% in the cities. Similar differences occur with speech (44.3% to 36%) and orthopedic (34.8% to 25%) impairments. Blacks are more represented for all handicapping conditions in the city schools.

The largest handicapping condition reported in both areas is other health impairments--chronic or acute health problems that limit vitality or alertness, such as tuberculosis, sickle cell anemia, or diabetes (Burgdorf, 1980). Of the sample of 3008 with valid ethnicity, urbanicity, and handicapping condition data, 1280 (42.6%) reported other health impairments.

Factor Analyses

The items previously assigned to independent living domains by the expert judges were factor analyzed within their respective domains to develop scales to assess those aspects of independent living. An iterative principal factor solution was obtained

using squared multiple correlations as initial communality estimates and an oblique rotation using the promax method.

Items with a factor loading above .30 were included. If an item loaded above .30 on more than one factor, the item was assigned to the factor of highest loading. Items which were theoretically consistent with the bulk of the items in a scale were retained. Table 3 presents the factors within each of the domains, and a brief explanation of each factor.

Once the factor analyses were completed, the factors were transformed to facilitate their use as scales to assess independent living across the range of domains. This was done by standardizing the factors so that each had a mean value of 50 and standard deviation of 10 for the population. The Spearman-Brown prophecy formula was used to estimate the reliability of each standardized scale (based on a common scale length of 40 items). The resulting reliability estimates ranged from .89 to .99, with a median of .95. (For a detailed description of the reliability calculations for each scale see: Harnisch et al, Digest on Youth in Transition, Vol. 2.)

Rural Versus Non-Rural Youth with Handicaps

The rural and non-rural youth were compared on each of the derived independent living scales using a t-test. The results of these are shown in Table 4 (" D" is the difference between group means, and positive values favor city students, negative favor rural students). As can be seen from Table 4, rural youth lag behind their city counterparts in a number of areas, but also lead in the following domains: church participation, work experience, extracurricular clubs and sports, household composition, and tax exemption status.

In the domain of self-advocacy and skills, the rural youth with handicaps are seen to be trailing their city peers in both the areas of computer skills ($t = 2.73$, $p<.01$) and the ability to find and use information ($t = 5.14$, $p<.001$). Both of these could be problems which could severely limit the future employment and educational opportunities of these rural youth (especially as one notes that the city youth are already below the population mean on these scales).

In the education, training, and employment domain rural youth have significantly more work experience than do their city peers ($t = -5.22$, $p<.001$), which may be because of leaving school at earlier ages. However, they trail in the areas of career expectations ($t = 7.09$, $p<.001$), and post-secondary education expectations ($t = 3.68$, $p<.001$). These two can be seen to relate to the adult milestones scale where the country youth expect to achieve adult milestones at significantly younger ages than do the city youth with handicaps ($t = 5.15$, $p<.001$). However, achieving such milestones too early can lead to a lack of future

opportunities by denying the access to education and training received by those who delay the milestones.

In their awareness of, or participation in, special education programs rural youth with handicaps are at another disadvantage to their city counterparts (t = 2.36, $p<.05$). This latter point raises questions of the availability of these programs to rural youth.

Rural youth with handicaps were at an advantage in several areas. They were significantly more involved in extracurricular clubs (t = -2.39, $p<.05$), and extracurricular sports (t = -1.93, $p<.05$) . This may be indicative of a more accepting population in the smaller towns and localities. Additionally, they were more likely to live with their families (t = -4.58, $p<.001$), but less likely to be a tax exemption for their parents (t = -2.57, $p<.01$), which may indicate that they were in full-time employment but still living at home.

In order to understand the differences between the rural and city youth with handicaps on these scales of independent living, a discriminant function analysis was conducted. To do so, 10 groups were constructed that represented the urbanicity by specific handicapping condition of the subjects, e.g, rural learning disabilities, city hearing impairments. The 19 independent living scales were used as predictor variables in this model.

The results of the significant discriminant analysis showed that there are two functions present in the data which accounted for approximately 70% of the variance. A third function accounted for slightly less than 8% more. The standardized canonical coefficients for these two functions are shown in Table 4. Examining the two significant function values shows that the first independent living function is represented by high weights on the career expectations, resource utilization, and computer skills scales. These scales have been shown to differentiate between the rural and non-rural youth with handicaps. This first function seems to reflect an Achievement Orientation.

The second independent living function is characterized by involvement in extracurricular clubs and the work experience scales. Additional independent living domains represented in this function include: household composition, tax exemptions, and church participation. In summary, the second function describes an Affiliation Dimension of independent living.

The centroids from the canonical correlations are plotted for the 10 groups in Figure 1. On the Achievement Orientation function, both city orthopedic and other health impairments groups (4 and 5) are found to have high scores, and the rural learning disabilities (6), hearing impairment (7), and speech

impairment (8) groups have quite low scores. This function basically discriminates between city orthopedic and health impairment groups versus the other handicapping conditions in the rural settings, and demonstrates that the achievement orientation is more evident in the city orthopedic and health impaired groups than in any of the rural groups.

The affiliation function, is characterized by the high scores of the rural orthopedic impairments group (9), and the low scores of the city learning disabilities (1) and speech impairment (3) groups. Three other groups, the rural health (0) and speech (7) impairment groups, and the city health impairment groups have moderately positive scores.

The class mean values for each of the scales are shown in Table 5. (These mean values should be read as their deviations from the population mean of 50 and standard deviation of 10.) By doing this, one can see that the youth with handicaps in both areas show substantial differences from the population means on many scales, for example, on the extracurricular clubs scale the rural orthopedic impairment group scores 55.06, one-half standard deviation above the population mean. In addition, the rural youth with handicaps are often much lower than their city peers (e.g., on career expectations the city learning disabilities group scores 45.37--almost one-half a standard deviation below the mean--and the rural learning disabilities group is at 42.56).

An examination of the means in Table 5 shows patterns of differences between the rural and non-rural youth with specific handicaps. The values for resource utilization show that in the city learning disabled (46.74) and speech disabled (47.81) students are quite low in comparison to the population mean (50), and the same students in the rural schools are much below the city students (LD--44.64, SI--45.62). Similar clear differences can be seen in the career expectation factor, with most city groups being much below the population mean, and the rural students much below the city ones (rural: LD--42.56, HI--44.89, SI--44.03).

There are also areas in which the values for the rural youth exceed those of the city. In church participation, the rural youth score at, or above, the population mean, while most of the city groups are below. This also emerged in the tax exemption and household composition scales. The rural youth tended to live away from their families more, but were more likely to be listed as tax exemptions. This may indicate a need to relocate for special education or rehabilitation resources.

The idea of special education programming is addressed in the awareness of special education programs scale. On this scale, all city groups reported scores above the population mean, but three of the rural groups were below it. This may indicate a

need for programs not being met for certain student groups in the rural areas. This may be reflected on the adult milestones scale where the city youth expect to achieve these milestones at younger ages than the average (e.g., LD--48.12, HI--47.37), and rural youth even younger (LD--44.48, HI--46.70, SI--45.76). While this can be regarded as a sign of early independence, taking on such adult responsibilities too early can deprive the person of many of the advantages of further education and training.

Two groups with handicaps showed dissimilar patterns to their peers. This is especially true for those with orthopedic impairments, but also for those with other health impairments. On Figure 1, those with orthopedic impairments (4 and 9) formed their own outlier group, scoring consistently above average on the two independent living discriminant functions.

Discussion

The results reported demonstrate the differences assessed in independent living between the youth with handicaps in rural and non-rural schools, and that these differences may have significant impacts on the ways in which these students will be able to lead their adult lives. There are also many similarities in the ways in which they have responded to the items, but often these are still below the average levels for the population studied.

The overall pattern of findings show that youth with handicaps are below the average on many aspects of life that they will need to master to be able to lead lives as productive and independent adults. On many of these scales, they are seen as not being able to achieve to the same level as their nonhandicapped peers, which places them in jeopardy for their later attempts at success.

Not only are youth with handicaps not achieving at as high a level as their peers, but their aspirations for the future are also much lower. Fisher and Harnisch (1987) found that those with handicaps expressed lower career expectations, and these were supported by lower the expectations of their parents, teachers, and significant others around them. Thus, building in limitations rather than possibilities. for future life success.

More important than the generalized findings are the specific differences which are found by handicapping condition within each of these locations. One can see that, by using these independent living scales, differing strengths and needs are identified for each condition. In this way, curricula can be rethought in such ways as to promote independent growth within those realms which are presently lacking, and to build on those

which are strengths. This could allow for the redirection of resources into newer programs which serve identified needs, rather than more general goals--specifically important when one considers the uneven distribution of handicapping conditions between locations.

When one considers the distribution of specific handicapping conditions between locations, one must also consider the make-up of the groups with these handicaps, and the best ways in which they may be served. The demographic data showed that in rural schools large proportions of those with learning disabilities (40.7%) and speech impairments (44.3%) are Hispanics. But, as Bernal (1983) has indicated, many schools which do not have funds for limited English students include them in the special education classes, serving neither the limited English nor the handicapped students adequately.

Summary

The presentation of the definition and the development of independent living scales are based on the notions of autonomy, personal control, and empowerment of the individual with handicaps. The scales can be used to identify both strengths and weaknesses within specific handicapping conditions, and within certain demographic groups who may be a part of the special education population. Both of these have been demonstrated by examining the comparisons between the rural and city students.

The derivation of independent living scales has been shown to be a useful way in identifying the differences between rural and city youth with handicaps. The t-tests and discriminant functions showed that rural youth with handicaps scored above their city counter parts in family and affiliation areas. A positive sign for those who need even more support in their striving for growth and development. There are several other domains in which the rural youth with handicaps were seen to trail the city counterparts, as well as the general population. However, one interesting finding is the extremely positive adaptation of the rural students with orthopedic impairments who scored well above the population mean on many scales.

Use of independent living scales could serve several educational purposes and provide the basis for policy formulation and review. By use of the definition, we have tried to highlight the different domains in which a person must have skills in order to live independently in our society. The scales have further refined the definition, and allow research and evaluation activities to assess the needs of the population of a school district, the curriculum, and the allocation of funds to special programs.

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Table 1. Number and Percentage of Handicapped (H/C) and Nonhandicapped (N-H/C) Students by Ethnicity and Community Type (N = 14,447)

		Hispanic		American Indian		Asian		Black		White		Total
		n	%	n	%	n	%	n	%	n	%	
City	H/C	573	28	44	2	28	1	407	20	1001	49	2053
	N-H/C	1913	22	122	1	362	4	1319	15	4979	57	8695
Rural	H/C	177	22	29	4	5	1	68	8	512	65	791
	N-H/C	529	18	92	3	26	1	206	7	2055	71	2908

Table 2. Frequency of Handicapping Conditions By Ethnicity and Community Type (N = 3008)

		Hispanic		American Indian		Asian		Black		White		Total
		n	%	n	%	n	%	n	%	n	%	
LD	City	118	29.8	10	2.5	21	5.3	68	17.2	179	45.2	396
	Rural	63	40.7	14	9.0	3	1.9	9	5.8	66	42.6	155
HI	City	121	33.7	11	3.1	9	2.5	47	13.1	171	47.6	359
	Rural	56	35.9	13	8.3	5	3.2	10	6.4	72	46.2	156
SI	City	99	36.0	9	3.3	15	5.5	54	19.6	98	35.6	275
	Rural	47	44.3	3	2.8	3	2.8	5	4.7	48	45.3	106
OI	City	48	25.0	1	0.5	1	1.6	23	12.0	117	60.9	192
	Rural	31	34.8	1	1.1	4	4.5	2	2.3	51	57.3	89
OH	City	228	24.4	21	2.3	29	3.1	184	19.7	473	50.6	935
	Rural	90	26.1	7	2.0	2	0.6	43	12.5	203	58.8	345

Key: LD--Learning Disabilities, HI--Hearing Impairments, SI--Speech Impairments, OI--Orthopedic Impairments, OH--Other Health Imp.

Source: High School and Beyond, 1984.

Table 3. Independent Living Domains and Factors

Self-Advocacy and Maintenance Skills

Factor I, Computer Skills. A high score is associated with experience with computer hardware and software.

Factor II, Resource Utilization. Questions assess skills necessary for gathering and using information, applying for jobs, college admission, etc.

Factor III, Technological Skills. A high score indicates experience in operating a variety of electronic equipment.

Factor IV, Life-style orientation. Questions assess the importance of various factors in living one's life.

Factor V, Academic Organization. Assesses the student's organization of class materials and his/her willingness to work hard in school.

Living Arrangements

Factor I, Financial Support. Scores reflect the amount of financial support provided by the family.

Factor II, Household Composition. A high score indicates that the student did not live with his/her family.

Factor III, Tax Exemption. Indicates whether a person was listed as a tax exemption by parents.

Factor IV, Adult Milestones. Scores reflect ages at which the person expects to attain each of a number of adult milestones (e.g., getting first job, finishing school, getting married). Lower scores indicate attainment at younger ages.

Community Integration

Factor I, Group Participation. A high score indicates active participation in group activities or leadership.

Factor II, Social Roles. A high score reflects the student's belief that others see him/her positively.

Factor III, Social Activities. Reflects how often the person engages in various social activities (e.g. dating, talking on phone to friends).

Factor IV, Church Participation. Scores reflect the level of church attendance and involvement in church activities.

Leisure and Recreation

Factor I, Extracurricular Clubs. Scores reflect the level of involvement in extracurricular clubs.

Factor II, Extracurricular Sports. Scores reflect the amount of involvement in athletic teams.

Education, Training, and Employment

Factor I, Work Experience. A high score indicates that the student has held job for pay and acquired work experience.

Factor II, Career Expectations. This is primarily associated with plans for, and behavior during, the first year after leaving school. High scores are associated with post-secondary education, while low scores reflect getting a job or becoming a homemaker.

Factor III, Post-secondary Education. This scale represents the type of post-secondary education being sought. High scores indicate planning for, and enrolling in, a four year college. Low scores are associated with vocational training. SCores in the middle of the range are associated with youth not seeking post-secondary education.

Factor IV, Awareness of Special Programs. Scores reflect the awareness of, and participation in, special high school programs.

Table 4. Comparisons of Rural and Non-Rural Youth on Independent Living Scales and Standardized Canonical Coefficients (n_C = 1814, n_r = 703)

Scale	M_{City}	M_{Rural}	D	t	Discriminant Functions I	Discriminant Functions II
Computer Skills	49.59	48.48	1.11	2.73**	0.20	0.16
Resource Util.	49.51	46.99	2.52	5.14***	0.38	-0.04
Technological Sks.	48.69	48.26	0.43	0.84	0.09	0.37
Life-style Orient.	48.27	47.83	0.44	0.82	0.14	0.10
Academic Org.	48.16	47.82	0.34	0.68	0.04	0.09
Group Particip.	50.16	49.69	0.47	1.07	0.04	-0.08
Social Roles	49.70	48.74	0.96	1.97*	0.02	-0.26
Social Activities	50.24	49.63	0.61	1.30	0.12	0.02
Church Particip.	49.83	50.41	-0.58	1.29	0.07	0.23
Extracurric Clubs	49.84	50.91	-1.07	-2.39*	0.04	0.51
Extracurric Sports	49.50	50.35	-0.85	-1.93*	-0.37	-0.02
Financial Support	49.58	48.95	0.65	1.46	0.10	0.05
Household Comp.	49.12	50.92	-1.80	-4.58***	-0.14	0.35
Tax Exemption	49.52	50.43	-0.91	-2.57**	-0.13	0.34
Adult Milestones	49.17	46.73	2.40	5.15***	-0.01	-0.13
Work Experience	50.34	52.37	-1.04	-5.22***	-0.13	0.42
Career Expectations	48.62	45.43	3.19	7.09***	0.65	-0.07
Post-secondary Ed.	49.40	47.89	1.51	3.68***	0.14	-0.20
Spec. Programs.	51.54	50.34	1.20	2.36*	0.10	-0.19

*p<.05 **p<.01 ***p<.001

Source: High School and Beyond, 1984.

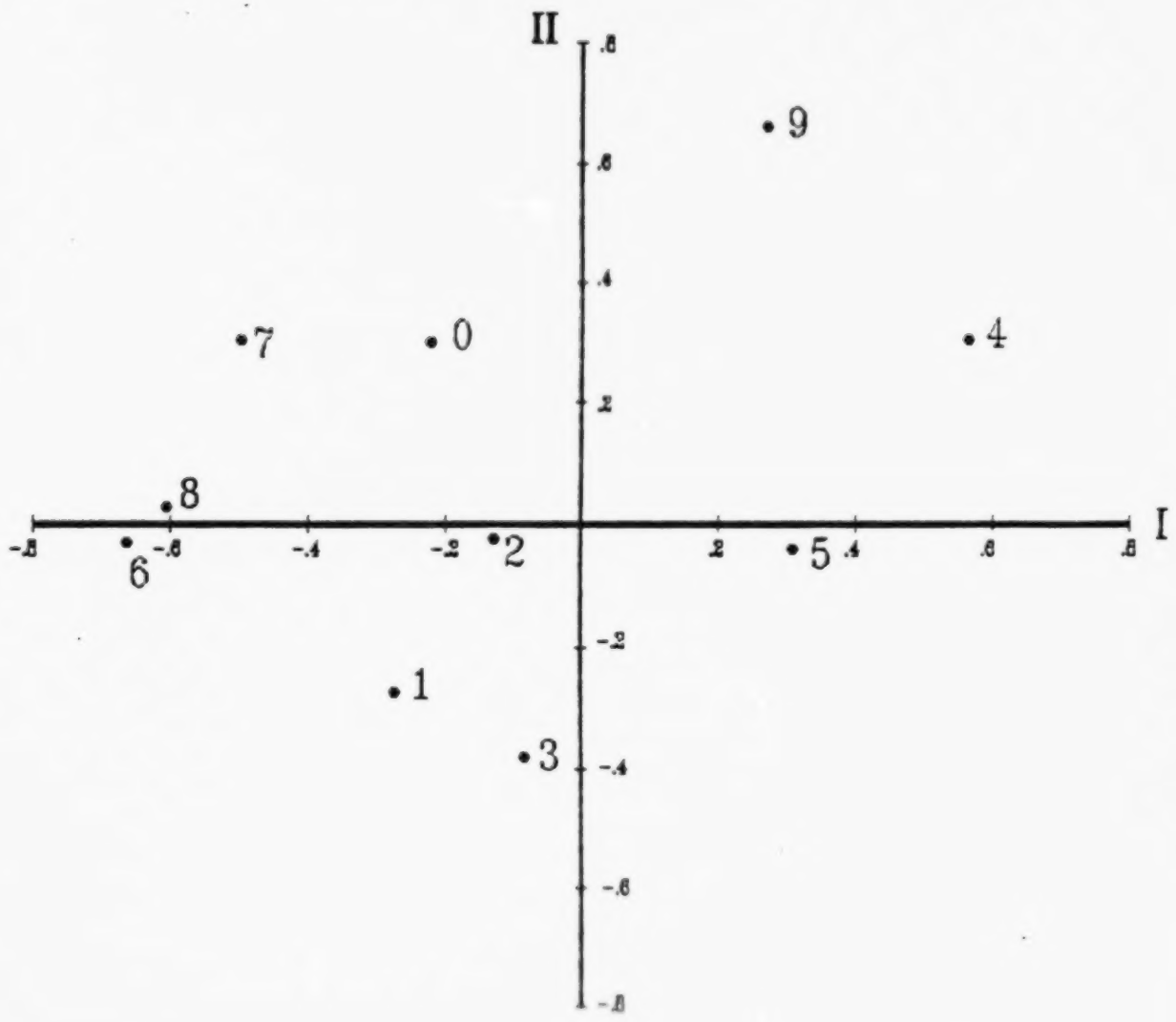
Table 5. Class Means for Independent Living Scales By Community Type and Handicapping Condition

	City					Rural				
Sample size	LD (396)	HI (359)	SI (275)	OI (192)	OH (935)	LD (155)	HI (156)	SI (106)	OI (89)	OH (345)
Scale										
Computer Sks.	47.30	48.49	48.17	52.55	50.37	46.17	48.56	47.22	50.65	49.00
Resource Use.	46.74	48.99	47.81	52.07	50.39	44.64	45.90	45.62	50.05	47.78
Techno. Sks.	45.91	48.61	45.80	52.20	49.57	46.18	48.66	45.35	51.00	48.88
Life-style	46.60	45.94	47.94	49.94	49.17	48.52	45.53	45.52	49.33	48.66
Academic Org.	46.73	45.92	47.76	48.46	49.20	47.27	45.46	46.80	50.41	48.51
Group Parti.	48.37	49.48	48.89	51.24	50.95	47.03	51.07	46.83	50.92	50.44
Social Roles	48.33	49.28	50.80	49.76	49.92	46.37	49.88	49.58	49.35	48.73
Social Acts.	50.24	51.33	48.03	50.66	50.58	49.64	50.62	47.29	47.55	50.23
Church Parti.	48.50	48.77	48.79	53.17	50.19	48.64	50.52	50.01	50.65	50.92
Extra. Clubs	47.81	49.92	49.07	50.88	50.37	47.51	50.95	48.51	55.06	51.66
Extra. Sports	48.89	50.38	50.71	49.31	49.17	49.80	52.96	49.91	49.44	49.92
Fin. Support	49.74	48.91	48.94	50.18	49.78	48.10	50.93	48.35	50.32	48.41
Household	48.62	49.54	48.89	49.20	49.17	50.15	51.07	51.07	54.29	50.44
Tax Exemp.	50.02	49.74	48.79	51.81	49.12	49.43	51.43	50.23	52.08	50.12
Milestones	48.12	47.37	48.85	51.10	49.71	44.48	46.70	45.76	49.56	47.09
Work Exper.	50.35	51.51	49.54	51.28	50.06	50.95	52.77	52.88	51.45	52.70
Career Exp.	45.37	46.63	47.83	52.10	49.67	42.56	44.89	44.03	51.47	45.63
Post-Sec. Ed.	47.30	48.24	50.18	50.45	49.95	47.47	48.53	46.44	49.76	47.78
Spec. Progs.	51.40	51.39	51.30	52.46	51.52	49.72	49.41	51.86	48.81	50.77

Key: LD--Learning Disabilities, HI--Hearing Impairments, SI--Speech Impairments, OI--Orthopedic Impairments, OH--Other Health Impairments.

Source: High SChool and Beyond, 1984.

Centroids on Two Independent Living Functions for Ten Handicap Groups



Legend:

- City
  - 1 Learning Disabilities
  - 2 Hearing Impairments
  - 3 Speech Impairments
  - 4 Orthopedic Impairments
  - 5 Other Health Impairments
- Rural
  - 6 Learning Disabilities
  - 7 Hearing Impairments
  - 8 Speech Impairments
  - 9 Orthopedic Impairments
  - 0 Other Health Impairments